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Assessing Poverty and Distributional Impacts of the Global Crisis in the Philippines

A Microsimulation Approach

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Abstract

As the financial crisis has spread through the world, the lack of real-time data has made it difficult to track its impact in developing countries. This paper uses a micro-simulation approach to assess the poverty and distributional effects of the crisis in the Philippines. The authors find increases in both the level and the depth of aggregate poverty. Income shocks are relatively large in the middle part of the income distribution. They also find that characteristics of people who become poor because of the crisis are different from those of both chronically poor people and the general population. The findings can be useful for policy makers wishing to identify leading monitoring indicators to track the impact of macroeconomic shocks and to design policies that protect vulnerable groups.

This paper—a product of the Poverty Reduction and Equity Unit, Poverty Reduction and Economic Management Network—is part of a larger effort in the department to analyze the poverty and distributional impacts of the 2008–9 financial crisis.. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors can be contacted at Carolina Sanchez (csanchezparamo@worldbank.org) and Ambar Narayan (anarayan@worldbank.org).

Assessing Poverty and Distributional Impacts of the Global Crisis in the Philippines: A Microsimulation Approach

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1. Introduction

The economic slowdown across the world caused by the financial crisis has taken its toll on poverty in developing countries. Recent World Bank global estimates for poverty suggest that the global slowdown caused by the crisis could add an extra 50 million to the number of people living below $1.25 a day and 64 million to the number below $2 a day, compared to a scenario of uninterrupted growth in the absence of the crisis. By 2010, the crisis is projected to add an estimated 89 million to the number of people living below $1.25 a day and 120 million to the number below $2 a day (Chen and Ravallion, 2009). Along with the impact on poverty numbers, the crisis is also likely to have significant impacts on the distribution of income and consumption *among* the poor and non-poor, both within and between countries. It is difficult, however, to predict the distributional impacts of the crisis with a high degree of confidence. Evidence from previous crises suggests that relative inequality falls about as often as it rises during aggregate contractions (Paci et al, 2008). Furthermore, as the crisis rapidly spreads across countries and *within* countries (through adjustments in domestic credit and labor markets and fiscal policies), its impacts across different groups, sectors or areas have become all the more difficult to track.

An analysis of how the crisis has affected poverty and distribution of welfare in a particular country – including Philippines, the subject of this paper – would need to address a few key questions. These are: how are the impacts going to be shared across the distribution of income or consumption, which sectors and regions are likely to be impacted, and what are the characteristics of those who would become poor as a result of the crisis? In order to be useful to policymakers, these questions would have to be analyzed *ex ante,* with available data that in most cases pre-date the crisis, rather than be delayed till the time post-(or during) crisis data become available. In the case of Philippines, the latest available household data is from 2006, which would imply that *any* analysis of how the crisis is likely to affect poverty and income distribution must rely on *ex ante* simulation methods. Even if some real-time data from households were available, an *ex ante* approach would still be needed to simulate impacts for hypothetical scenarios that have not yet occurred, or the impacts of other, unanticipated shocks to the economy (in the case of Philippines, typhoons that occurred very recently) .

Current approaches to analyze *ex ante* the impact of a macroeconomic shock, with the limited data available in most countries, are somewhat inadequate in addressing the kind of questions posed above. To improve upon existing approaches given the typical data constraints seen in most developing countries, including Philippines, we use in this paper a microsimulation model to evaluate *ex-ante* the distributional impacts of the crisis in a country. Section 2 below provides a brief background of poverty trends in Philippines in recent times and the macroeconomic impact of the crisis in the country. Section 3 outlines a rationale for our microsimulation model and presents the model, starting with an overview of the approach and subsequently outlining each step in detail, and ending with the key limitations and caveats to the model. In Section 4, we discuss the results of our simulations on the poverty and distributional impact of the crisis in Philippines. Section 5 concludes the paper summarizing key findings and discussing a few implications of the results for the country.

2. Setting the context: The Philippine economy and the crisis[1]

The Philippines enjoyed high growth throughout the 1990s and into the early 2000s. These years were also witness to a decline in poverty, as the proportion of Filipinos leaving below $1.25/day fell from 34.9 to 22.0 between 1985 and 2003. This is equivalent to a 35.2% reduction in poverty during the period. Despite this general trend, however, estimates using the $1.25 benchmark show that poverty increased in recent years, consistent with official estimates. Between 2003 and 2006, the Philippines' $1.25/day poverty increased from 22.0 to 22.6 percent (or 1.7 million people). Meanwhile official estimates show an even higher increase in poverty, from 30.0 to 32.9 percent.

As in many developing countries, there is wide variation in Philippines in the incidence of poverty across regions and between rural and urban areas. Rural poverty rate was 46% in 2006, compared to an urban poverty rate of around 20%. Regional variation in poverty rate was as significant – ranging from 10% in NCR to 47% in Mindanao. In addition, poverty rates were around 20% or below for Central Luzon and Calabarzon, and 35% or higher in Other Luzon, Visayas and Mindanao.

In addition to income poverty, there are myriad development challenges facing the country. The country has a high Gini coefficient (an index of income inequality) as compared to its Asian neighbors, and many key MDG targets, especially those related to universal primary education and certain health indicators, are unlikely to be achieved by 2015.

The financial crisis, coupled with the food and fuel crisis of 2008, is likely to have a significant impact on poverty in the Philippines, which has been suffering from lagging labor market outcomes since the start of the decade. Real wages have been declining since 2001 (especially since the food price shocks of 2007-08), and unemployment was persistently high, averaging 7.4% in 2008. 50% of the unemployed were in the 15-24 age group and there is a high incidence of unemployment even among the college-educated.

An interesting feature of the Filipino economy is that there has historically been a low (and often slightly negative) output elasticity of employment, which translates to low responsiveness of employment rate to economic growth. Although the exact reasons for this are unknown, it is hypothesized that this is due to either an increase in returning Overseas Filipino Workers (OFWs), increased labor market participation from spouses and children, or increased employment in informal sectors, accompanied by a decline in the wage and salaried employment.

Macroeconomic projections of crisis impact

The nature of the Filipino economy, as well as real-time evidence that has emerged during the crisis, suggest that the impact of the crisis in Philippines would be transmitted primarily through the following channels.

[1] All figures cited in this section, as well as the ensuing discussion, are based on findings from World Bank (2009a) and World Bank (2009b).

Firstly, reduced demand for exports, which account for 47.3% of the GDP, is likely to result in reduced labor demand, particularly in the electronics, textile, and garment sectors. As urban, formal sector workers lose their jobs, they could move to the informal sector, which would tend to depress informal sector wages. Secondly, domestic remittances from urban workers to rural households are likely to decrease. This is problematic in light of the fact that 47% of households in 2006 relied on domestic remittances as a source of income. *Thirdly, a reduction in international commodity prices* (for example, the price of coconut) may have an adverse impact on the income of agricultural workers.

Although a reduction in foreign remittances could have potentially occurred due to the impact of the crisis in labor markets countries where OFWs are located, the available macro projections do not contemplate such a decline but rather predict a slightly increase in international remittances (Table 1). OFWs account for an estimated 27.5% of the total labor force, and send remittances to about a quarter of Filipino households, in amounts that add up to as much as 10% of GDP.

Table 1: Real output growth projections in Philippines (%)

	Benchmark		Crisis	
	2009	**2010**	**2009**	**2010**
Total GDP (real)	4.7	5.0	1.4	3.1
Agriculture	3.0	3.0	1.1	2.2
Manufacturing	4.0	4.2	(6.2)	1.0
Other Industries	6.7	6.7	12.1	8.6
Services	5.3	5.7	2.9	3.2
Remittances (USD billions nominal)	17.9	19.5	17.1	18.0

Source: World Bank Philippines country team

Table 1 shows the aggregate and sector-specific growth rate projections for the Philippines, obtained from the World Bank Country team (see Annex 2, Table A.2 for more detailed data). Two macroeconomic scenarios are considered for each of the years (2009 and 2010): (i) benchmark – the scenario that was expected in the absence of the crisis; and (ii) crisis – the scenario that is expected (or occurred in the case of 2009) with crisis.

Overall GDP growth is expected to be 3.3 and 1.9 percentage points lower with crisis than in the benchmark scenario in 2009 and 2010 respectively. The biggest shock is expected in manufacturing, primarily due to a fall in demand for manufacturing exports. In 2009, the growth of manufacturing output is estimated to fall by 10.2 percentage points, from a 4% expansion to a 6% contraction. The sector is expected to register a small positive growth rate in 2010, but that will still be 3.2 percentage points lower than what manufacturing growth would have been in the absence of the crisis.

The spillover effect from the decline in manufacturing – including lower domestic demand for goods and services – is likely to have an impact on other sectors as well, especially services. Output growth in the services sector is projected to decline due to the crisis by 2.4 and 2.5 percentage points in 2009 and 2010, respectively, compared to the benchmark (no-crisis) scenario. Some impact is expected in the agricultural sector as well due to the spillover effect from other sectors and reduced commodity prices. Agricultural output growth projected to be lower by less than 1.9 percentage points in 2009 and 0.8 percentage points in 2010 due to the crisis. It is important to note that all sectors, with the sole exception of manufacturing in 2009, are expected to register positive growth for both years even with

the crisis. The "loss" in growth is in comparison to the scenario of no-crisis for the relevant year, rather than indicating a fall in output from one year to the next.

Interestingly, output growth in the sector "other industries" is expected to be higher during the crisis than in the no-crisis scenario (Table 1). In 2009 and 2010, the output growth in other industries is expected to be 5.4 and 1.9 percentage points higher in the crisis scenario than in the benchmark scenario. Most likely, this reflects the impact of the stimulus package put in place by the government in response to the crisis, which includes substantial resources for public investment projects and is expected to boost the construction sector.

In addition, the crisis is expected to have a limited impact on remittance flows of $0.8 billion in 2009 and a larger impact of $1.5 billion in 2010 (Table 1). However, even with the crisis, remittances are expected to grow by $1.6 billion between 2008 and 2010, which is about half of the $3.1 billion growth during this period that was projected in the absence of the crisis.

In sum, the macroeconomic impacts of the crisis are estimated to be reasonably large in 2009, with a slight recovery in 2010. The impacts are driven mostly by a sharp contraction in the manufacturing sector. Remittances do not appear to be a significant factor in driving changes in household income in 2009, implying that the effects of the crisis on households are likely to be felt mainly through its impact on employment and labor earnings.

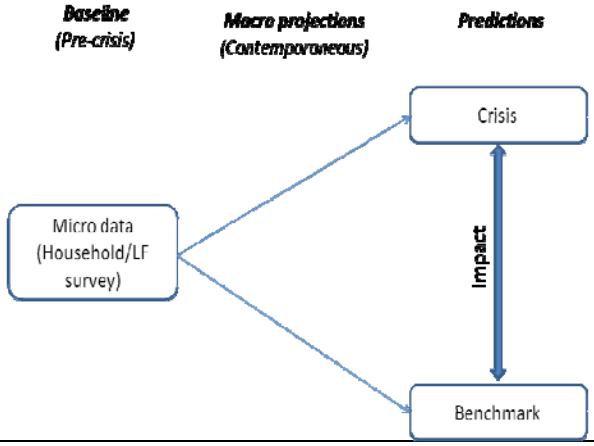
3. Proposed approach to simulate poverty and distributional impacts

We propose to use a microsimulation model that combines macroeconomic projections with pre-crisis micro data from household and/or labor force surveys to predict income and consumption at the individual and household level under different scenarios, which can then be compared to measure poverty and distributional impacts. Comparisons will be made between different *projected* scenarios (most commonly a crisis or low scenario and a benchmark or base scenario) rather than a comparison over time (i.e. a comparison between 2006 and 2009 or 2010 in the case of the Philippines). Figure 1 presents a stylized representation of the methodology.

The model focuses on labor markets and migration as transmission mechanisms and allows for two types of shocks: shocks to labor income, modeled as employment shocks, earnings shocks or a combination of both; and shocks to non-labor income, with special attention paid to international remittances. Shocks can be positive or negative depending on the trends outlined by the macroeconomic projections. In most cases labor income and remittances account for at least 75-80% of household income. Minimum assumptions are made about other sources, such as capital and financial income or public transfers, as discussed below.

The data requirements can be summarized as follows. At the macro level, information is needed on projected (i) output, employment, remittances and (ideally) labor earnings growth; (ii) population growth and (iii) price changes. At the micro level, information is needed on (i) labor and non-labor income, and (ii) labor force status and basic job characteristics, including earnings. Needless to say, the reliability and accuracy of the simulation results is a direct function of the quality and level of detail of the information available at the macro and micro levels.

Figure 1: Microsimulation methodology

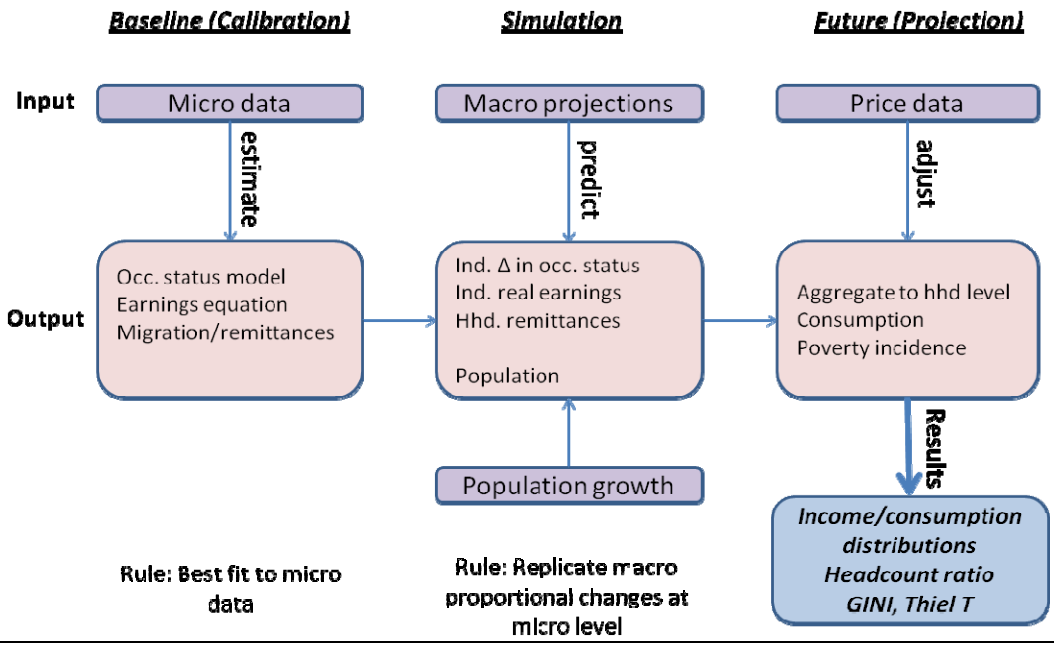


Finally, the income and consumption projections from the model can be used to produce a variety of outputs, including aggregate poverty and inequality comparisons across scenarios, poverty and vulnerability profiling of specific groups and/or areas, and various summary measures of distributional impacts, such as growth incidence curves and state transition matrices. We comment on these extensively for the case of the Philippines below.

Overview of simulation exercise

In this Section we provide a brief overview of the mechanics underpinning the simulation exercise. The exercise can be broken down into three distinct steps: calibration, simulation and assessment of impacts. A description of each step follows and a schematic of the complete model is presented in Figure 2.

Figure 2: Schematic of the microsimulation model



Calibration. Calibration is the process by which household and individual-level information is used to model labor market behavior and outcomes and to predict the likelihood of receiving remittances.[2] This is done in three steps. First, we model labor force status for all working age individuals (15-64) as a function of household and individual characteristics, where labor force status can be out of the labor force, unemployed, and employed in agriculture, manufacturing, other industries or services. Although ideally we would like to work with a more detailed menu of options, the number of labor force states that can be considered is dictated by the level of disaggregation available for the macro projections. We then use a multinomial logit to estimate the parameters of the model, as well as the individual-level probability of remaining in a particular state and/or changing to a different one, as given by (1). The approach is similar to that used in Ferreira et al (2009). We estimate the model separately for high and low-skill individuals to allow for structural differences in the labor market behavior of the two groups.[3]

$$I^{G}_{i,\,j=s} = Ind\left[a^{s} + z_i\, b^{s} + u^{s}_{i} > a^{j} + z_i\, b^{j} + u^{j}_{i} \mid \forall j \neq s\right] \tag{1}$$

where s = Labor force status; G = labor skill level (high/low); z = gender, age, education, region, remittances, presence of public sector employees in the household and land ownership.

Second, we model labor earnings for all employed individuals ages 15 to 64 as a function of individual and job characteristics and use a standard Mincerian OLS regression to estimate the parameters of the model, as given by (2) (similar to Ferreira et al. 2008). We use a fairly broad definition of labor earnings for the purpose of the exercise that includes wages and salaries, but also income from self-employment. This is particularly important in the case of agriculture and for economies with large informal sectors, such as Philippines, since wage and salaried workers constitute a limited fraction of those employed in these sectors. It may lead however to a loss in precision and/or predictive power given that the structural relationship between individual and job characteristics and earnings could be different for salaried and non-salaried workers. To allow for maximum flexibility and (indirectly) account for some of these differences we estimate the model separately for agriculture, manufacturing, other industries and services and for low and high-skill workers.[4]

$$\log w^{G}_{i} = \alpha^{G}_{s} + x_i\, \beta^{G}_{s} + v^{G}_{s,i} \tag{2}$$

where x =gender, age, education, region, land ownership, and indicators for export industry, salaried and public employment.

The results of the estimation of equations (1) and (2) and a full description of all variables can be found in Annex 1.

[2] We estimate a reduced form of the household income-generation model which is based on Bourguignon and Ferreira (2005) and Alatas and Bourguignon (2005)

[3] For Philippines, low and high-skilled refer to individuals with 0 – 9 and >10 years of education, respectively.

[4] Notice that, although we could estimate separate models for salaried and non-salaried workers based on the information from the household survey, we would not be able to use these models for the purpose of predicting future earnings since we do not have earnings and employment information disaggregated by salaried/non-salaried workers from macro data.

Finally, we focus on non-labor income. For this purpose we design an assignment rule for changes in international remittances and make some minimal assumptions about other sources of non-labor income. Ideally, we would estimate a probability model to predict how likely a household would be to receive international remittances, given its characteristics. However, if the migration-related information in the survey is poor or insufficient and/or the predictive power of probability model is low (as is the case for Philippines), we are better-off relying on a simple non-parametric assignment rule that is consistent with the existing evidence (the specific rule used for Philippines is discussed in more detail when we describe the simulation process).

Simulation. Simulation is the process by which information on aggregate projected **changes** in output, employment and remittances is used to generate **changes** in labor and non-labor income at the micro level using the structural models developed as part of the calibration.[5] This is done in four steps.[6] First, we use population growth projections to adjust for demographic changes between 2006 (base year) and 2009-2010. This adjustment is particularly important in the case of Philippines because fertility rates are still high, which implies that the number of labor market entrants rises faster than overall population, and the baseline household survey is relatively old. In practical terms, doing this allows us to explicitly take into account changes in the size of the working age population, and hence to distinguish between employment growth driven (or rather absorbed) by demographic trends and net (or additional) employment growth.

Secondly, we use the projections from the labor force status and labor earnings models to replicate projected changes in aggregate total and sectoral output and employment. We start with employment and calculate the total number of individuals that need to be reassigned between employment and non-employment and across employment sectors in order to match projected aggregate changes in total and sectoral employment. We then use the estimated probabilities from the multinomial model to select candidates for reassignment.[7] The direction and magnitude of flows between employment and non-employment and across sectors of employment is given by changes in the relative shares of different status with respect to the reference population. For instance, whether individuals must be reassigned from non-employment to employment or vice-versa depends on whether the employment rate of individuals ages 15 to 64 is increasing or decreasing. Similarly, workers are expelled from sectors whose relative share in total employment are declining and absorbed into sectors whose relative share in total employment is increasing.

The sequence in which individuals are reassigned across states and sectors matters for the final simulation results so we briefly describe here the procedure we follow:

[5] We do not assure consistency (i.e that absolute aggregate magnitudes are equal) between the data set used at the two modeling stages (see Bourguignon et. al 2008). Additionally, we assume equal changes at macro and micro levels. We cannot run a test if macro changes are similar or not to micro changes because of lack of a panel data at micro level (see Deaton 2001 and Bourguignon et al 2008).

[6] This sequence for introducing changes in the model is based on Vos et al (2002)

[7] We add error terms which represent the unobserved heterogeneity of agents' labor supply behavior. These lead to some disparateness in responses to a change in the labor demand, capturing the fact that in the real world individuals who are observationally equivalent (i.e. have identical observable characteristics) might still respond differently the same change in labor demand.

- Step 1 - Flows in and out of the labor force: If the labor force participation rate is increasing, non-participants with the lowest predicted probability of being out of the labor force will be reassigned. If the labor force participation rate is declining, participants (employed and unemployed) with the highest probability of being inactive will be reassigned. Reassignments will continue up to the point where the change in the labor force participation rate at the micro level matches the change at the macro level.
- Step 2 - Flows out of contracting sectors: For sectors whose share of total employment is declining, those individuals with the lowest predicted probability of being employed in the sector will be selected out and added to the pool of "eligible" workers to be unemployed or employed in growing sectors (notice this pool also contains those who have been reassigned from outside the labor force if the total participation rate is growing). Reassignments out of each sector will continue up to the point where the change in the sector employment share at the micro level matches the change at the macro level.
- Step 3 – Flows into growing sectors: Individuals in the pool of "eligible" workers will be assigned to growing sectors on the basis of their predicted probability of being employed in each sector. Assignments are made sequentially with the sector whose employment share is growing fastest absorbing workers first and the sector whose employment share is growing the slowest absorbing workers last. Reassignments to each sector will continue up to the point where the change in the sector employment share at the micro level matches the change at the macro level.
- Step 4 – Unemployment: Individuals that remain in the pool of "eligible" workers after changes in sectoral employment have been accounted for are classified as unemployed. In other words, unemployment functions as the adjustment variable once predicted changes in the labor force participation and employment rates have been simulated.[8]

There are a few important features of this process that are worth mentioning. The reassignments described in steps 1 to 3 are calibrated so as to replicate **net** aggregate flows between employment and non-employment and across sectors. In reality, movements across these different states are quite significant so that gross flows are usually larger than net flows. The order of proposed steps is such that it allows for non-employed individuals to become employed and employed individuals to become non-employed, but also for individuals to change sectors. In doing this we try to capture the fact that highly "employable" individuals are more likely to remain employed in one sector or another, at times at the expense of less "employable" workers (i.e. highly "employable" workers will crowd others out when employment opportunities become relatively more scarce).

We next use the earnings model estimated as part of the calibration to predict earnings for two groups of workers: those with no previous earning history (i.e. non-employed in 2006) and those who change sector of employment. Because earnings are a function of both observable and unobservable individual

[8] In practice this means that projected unemployment figures may appear somewhat out of line with historical data. For this reason, we often present the simulation results in terms of employment and non-employment, which is a perfectly valid classification from the point of view of examining poverty and distributional impacts given that only those employed receive labor income.

and job characteristics, we add a random element to the predicted earnings produced by the model to account for unobserved heterogeneity.[9] For all other individuals, we use the earnings information available in the household survey.

Once all workers have been assigned positive labor earnings, total earnings in a sector are adjusted to match aggregate projected changes in output. This step relies on the fact that that projected changes in sectoral output can be explained by projected changes in sectoral employment and projected changes in sectoral earnings and profits, and *assumes* that earnings and profits grow at the same rate.

The treatment of public sector workers and those with more than one job differs slightly from what we just described. Total public sector employment is assumed to remain constant (i.e. no individuals are assigned to or out of the public sector) and labor earnings of public sector workers are adjusted in line with their sectoral mapping (agriculture, industry or services). Similarly for those holding more than one job, we assume the sector of employment of their secondary activity remains constant while earnings are adjusted in line with sectoral changes.

The third step in the simulation process pertains to changes in international remittances. As mentioned above, in the case of Philippines we simulate these changes following a very simple allocation rule. We calculate the total change in international remittances between 2006 and 2009-2010, using actual and projected data (this change is positive under both the crisis and the benchmark scenarios) and allocate the dividend as follows: (i) across regions, remittances are allocated proportionally to the 2006 regional distribution; (ii) among households within regions: recipient households are selected at random and given a remittance transfer equivalent in real terms to the average remittance transfer in that region in 2006, with the *number* of total transfers to be made within each region being equal to the total amount of additional remittances to be distributed divided by the 2006 average value. As a result of this process the overall distribution of remittances across regions remains unchanged; while there is an increase in number of recipient households (both types of households, those who did or did not receive remittances in 2006, *can* receive new remittances in 2009-10).

Finally we simulate changes in other sources of non-labor income. For this we assume that capital and financial income grow at the same rate as real GDP, public transfers (primarily safety net and Social Security transfers) remain constant in real terms at 2006 levels, and domestic remittances change at the same rate as labor income. These assumptions appear to be reasonable for Philippines, and can be modified for other countries depending on country circumstances.

Assessment of Impacts. Impact assessment is the process by which we use the information on individual employment status and labor income, as well as on non-labor income at the household level, to generate income distributions and construct various poverty and distributional measures that can then be used to compare the crisis and the benchmark scenarios. This is done in three steps.

[9] Specifically, we draw an individual error from the error distribution generated during the estimation of the earnings equation.

First, we account for the fact that between 2006 and 2009-2010, food prices have increased at a much higher rate than other prices. To do this we adjust the 2006 poverty line by the expected food and non-food CPI in 2009 (or 2010), using the food and non-food shares in the NCR poverty line as weights (approximately 57% and 43%, respectively). Since these weights are different from those in the CPI, the adjustment reflects the poverty line required for an individual to be able to afford the same food basket despite the disproportionate rise in food prices. This method yields a 2009 (or 2010) poverty line, which we then readjust to 2006 prices using the appropriate general CPI (see Annex 2, Table C).

Second, we calculate total household income by aggregating labor income across all employed individuals and adding non-labor income, and then use information on household size to construct a measure of per-capita household income, as in (3).

$$PCI_m^* = \frac{\left(\sum_{i=1}^{k_m} w_i^* \ I_i^* + y_m^{NL*} \right)}{k_m} \tag{3}$$

Finally, we use information on household and individual income levels to evaluate the poverty and distributional impacts of the crisis by comparing poverty and other outcomes between the benchmark (without crisis) and "with crisis" scenarios. It is important to note that the Philippines poverty line is defined in terms of per capita income, which implies that per capita household income derived from (3) above can be directly compared with the poverty line to obtain poverty measures.

Limitations and caveats of the simulation exercise

The proposed approach has some appealing features, the primary one being its capacity to generate income counterfactuals at the individual and household levels that can then be used to assess impacts across the entire distribution. However, it also has some important limitations that must be taken into account when interpreting the results presented below. We discuss these below.

Firstly, the quality and accuracy of the simulation output is a function of the nature and quality of data underpinning the exercise. The results would depend not only on the micro-models, but also on the macro projections of the crisis *and* the benchmark or no-crisis scenarios. In a typical *ex-ante* assessment of this type, building the counterfactual to evaluate impact is especially tricky because the comparison between the situations "with" and "without" the "treatment" (the macro shock) is purely virtual or notional. This is particularly important with regard to the output and employment projections since they are key drivers of the results in the absence of a CGE or similar model. In addition:

- The ability to account for heterogeneity across sectors, groups, and others depends on the level of disaggregation of the available macro projection. For instance, the behavior of the tradeable and non-tradable sectors within industry can only be modeled separately if output growth projections are available for each sector.
- The ability to accurately predict employment and earning changes depends on the available information and on the assumptions needed to correct for information gaps. For instance, in the absence of projections on total and sectoral earnings growth, we need to assume that earnings

and profits grow at same rate within a sector. How realistic this assumption is would depend on the country and sectoral context.

- The ability to directly model and predict changes in the relative shares of formal and informal employment within sectors is limited by the lack of projections on the growth of each type of employment. Instead, formal and informal status are assigned in proportion to what is observed in 2006 for each sector and consequently all compositional changes in sectoral employment are driven by population growth and individual employment transition, rather than more general labor market cyclical dynamics.
- The ability to model remittances depends on the quality of the available data on migrants and remittances, particularly for countries with rapid and/or volatile growth of remittances.

Secondly, the simulations implicitly assume that the structural relationships estimated as part of the calibration process on the baseline data continue to be valid in the future years for which the projections are made. The more distant in the past the baseline year is, the more questionable this assumption is likely to be. In the case of Philippines, for example, the baseline year is 2006, which is a full 3 to 4 years away from the prediction years (2009 and 2010). This particular caveat, however, links directly back to the constraints imposed by availability of data. In most countries, household survey data that is available for analysis and processed to the extent necessary for the analysis is likely to pre-date the prediction years (usually 2010) by at least 3 to 4 years. [10]

Thirdly, there is no mobility of factors (labor or capital) across regions and across urban and rural areas under the current model formulation. The same is true about international migration. Consequently all individuals are assumed to remain in their 2006 place of residence, irrespective of whether they experience a change in labor force status or not.

Fourthly, our model is also limited in its ability to account for shifts in relative prices between different sectors of the economy as a result of the shock. The model *does* take into account the impact of shifts in the price of food relative to general inflation on poverty measures, via the simple device of adjusting poverty lines that are anchored to a fixed food basket. It can be argued that changes in the relative price of food represent the most significant source of price impact on poor or near-poor households in a country like Philippines, as the recent food crisis has shown. At the same time, there are other potential sources of price impacts – for example, the effect of a change in the terms of trade between agriculture and other sectors on real household incomes in all sectors – our approach does not take into account. Unfortunately, in the absence of a CGE model to link up to, it is nearly impossible to explicitly model for changes in terms of trade between sectors.

The *final* limitation, related to validation of hypothesis, applies to *all* ex-ante approaches including ours. The only validation or test for our simulation model is to combine ex-ante and ex-post analysis (see Bourguignon and Ferreira, 2003). Since ex post data will not be available for some time, some

[10] An additional caveat, for some countries, relates to our decision to work with income rather than consumption data. This caveat however only applies to countries where poverty is measured against a poverty line defined in terms of consumption, rather than income. In the case of Philippines, since poverty is measured as a function of household income, our approach is entirely appropriate.

uncertainty about the simulations generated by the ex-ante evaluations is bound to remain. However, a preliminary validation of the model using historical data suggests that the model performs well in predicting poverty and distributional changes (i.e. projected changes are very close to actual data).

4. Presentation of simulation results

Before describing the impact on poverty, it is useful to trace the way the macro impacts are transmitted to the households. In the Philippines, given the nature of the macroeconomic impacts, the main transmission channel is the labor market.

What did the Filipino labor market look like in the baseline year before the crisis? In 2006 – the last year for which household poverty data are available and therefore the baseline data for our projections – 69% of the working-age population (15-64) was active in the labor force, of which about 91% was employed. Among those employed, 51% were employed in services, 34% in agriculture, 10% in manufacturing, and 6% in other industries. The employed population includes those working for wages/salaries, the self-employed and those contributing labor to household-based enterprises or activities that produce income for the household. On average, 67% of household income comes from labor earnings and 15% comes from international remittances, which form about 22% of non-labor income (see Annex 2, Table B for detailed figures).

The *population growth rate* between 2006 and 2010 is projected to be 8.2%, with a higher growth rate (10.8%) projected for the working age population.

Employment growth projections for 2009 and 2010 are computed using past trends in output and employment and GDP projections shown in Table 1 above.[11] Lower GDP growth rates in 2009 and 2010 due to the crisis would translate into employment impacts. Historically, the output elasticity of labor force participation has been slightly positive in the Philippines, which is reflected in our results. Labor force participation is slightly higher in the crisis scenario than in the benchmark scenario, both in 2009 and 2010. Employment rates among the active population, however, show a different pattern. The overall employment rate in the crisis scenario is 1.0 and 1.8 percent lower than in the benchmark scenario in 2009 and 2010 respectively (see Table 2). Interestingly, the impact of the crisis on poverty is larger in 2010 than in 2009 despite a recovery in economic growth will recover in 2010. This is due to the fact that the 2010 figure reflects the cumulative

Table 2: Employment projections (individuals aged 15-64 yrs)

	% difference in levels between benchmark and crisis	
	2009	**2010**
Inactive	-1.2	-1.8
Active		
Unemployed	20.1	35.6
Employed	-1.0	-1.8
Sectoral employment		
Agriculture	-1.0	-1.4
Manufacturing	0.5	0.6
Other Industries	-0.9	-1.3
Services	-1.2	-2.5

Source: Own calculations using GDP data and HIES (2000, 2005)

[11] See Annex 2, Tables A.2 and A.3 for detailed projections.

effect of the crisis in 2009 and 2010. Finally there is very little impact on the sectoral *shares* in employment, although each sector is worse affected in 2010 than in 2009.

Aggregate impact on poverty and inequality

Average household income is expected to be 2.2% lower in 2009 and 3.6% lower in 2010 as a result of the crisis, compared to the benchmark (no-crisis) scenario. The drop in 2009 income is mainly due to a 3.0% drop in labor income, along with a marginal (0.6%) drop in non-labor income. In 2010, the larger impact is due to drops in both labor income (4.6%) and non-labor income (1.9%). The significantly higher loss in non-labor income in 2010 is due to a larger (2.3%) loss in remittances in 2010 compared to a 0.5% drop in 2009 (see Annex 2, Table B for the detailed estimates on household income).

The poverty headcount rate is expected to be 1.45 and 2.07 percentage points higher as a result of the crisis in 2009 and 2010 respectively. The impacts on poverty gap and severity are smaller (between 0.71 and 1.02 percentage points) for both years, but again slightly higher for 2010 than 2009. The impact of the crisis on aggregate measures of inequality is negligible.

Table 3: Poverty and inequality with and without crisis

	Percentage point difference between crisis and benchmark scenarios	
	2009	2010
Poverty		
-Headcount rate	1.45	2.07
-Poverty gap	0.71	1.02
-Severity of poverty	0.1	0.59
Inequality (per capita exp.)		
-Gini	0.001	0.001
-Theil	0.002	0.005

Source: Own calculations based on micro-simulations using macro projections and FIES (2006)

Interestingly, the impact on household income and poverty is higher in 2010 than in 2009, in spite of the fact that the impact of the crisis on GDP growth is expected to be larger in 2009 (refer to Table 1, Section 2). There are two main explanations for this apparent puzzle. Firstly, remittances flows from abroad – which contribute significantly to a household's non-labor income – show no decline in 2009 due to the crisis but are expected to be lower in 2010 due to the crisis (relative to the no-crisis scenario). Secondly, the impact on household income and poverty

Box 1: Price adjustments underlying the poverty projections. All projected incomes are at 2006 prices. This would normally imply that no adjustments are necessary for the poverty line (defined at 2006 prices) as well, had it not been for the fact that food prices have risen at a faster rate than the general Consumer Price Index (CPI) since 2006 (by 19.3% as compared to the general CPI rise of 18.8%). Given that the poverty line is anchored to a fixed basket of food items necessary to meet the basic minimum calorie needs of an individual in 2006, a higher appreciation of food prices relative to general inflation would imply that the same poverty line may no longer be sufficient to purchase the basic food basket in 2009 or 2010.[1] This would imply that the poverty line for 2009 and 2010 must be adjusted upwards (as described above) to reflect the same level of welfare as in 2006.

Food prices – most significantly rice prices – in Philippines rose sharply during 2008 in response to the worldwide food price shock, which likely led to a temporary spike in poverty rate. Since rice prices have moderated since late 2008, the food CPI projections for 2009 and 2010 are likely to reflect the expected trend of prices rather than the temporary spike in 2008. That said, the poverty projections will change if the financial crisis were to have a further significant dampening (or upward) effect on domestic food prices, *beyond* what is reflected in the projected price indices used for our simulations.

in 2010, relative to the no-crisis scenario, is the result of the cumulative impact of the crisis on employment, labor and non-labor incomes in *both* 2009 and 2010. Both these facts result in the income and poverty impact of the crisis being higher in 2010 than in 2009, and higher in 2010 than what the GDP growth impact in 2010 may suggest.

How the poverty impact is spatially distributed – across regions and urban/rural areas

The impact of the global crisis is not distributed uniformly across the Philippines. The crisis is expected to have a larger effect on urban centers with a large manufacturing base. Thus we expect to find greater impacts in the richer and highly urbanized regions of NCR, Calabarzon, and Central Luzon, which together account for nearly half of employment in the industry and services sectors, including the manufacture of electronic products. These regions also receive the most international remittances.

Our simulation results conform to these expectations. The poverty headcount rate is higher by more than 10% due to the crisis (as a percentage of the poverty rate in the no-crisis or benchmark scenario) in NCR, Calabarzon, and Central Luzon (Figure 3). The poverty rate in the highly dense, urban region of NCR, which is home to Manila, is projected to be higher by about 25% due to the crisis. The regions of Visayas and Mindanao, which are more rural and dependent on agricultural employment, are less affected (lower than 7% poverty impact), despite the decline in the prices of copra and coconut oil, which are among the country's largest exports.

Box 2: Poverty impact of the October 2009 typhoons

The Philippines was hit by four typhoons in the month of October, 2009, two of which made landfall in the National Capital Region of Manila. All together, the typhoons had a devastating cumulative effect, causing heavy rain and winds, and massive floods which washed away shanty towns on the coast. Access to electricity was severely affected, and over 300,000 houses are believed to have been damaged. The typhoons are expected to result in lower output and greater poverty. Our microsimulation model is able to capture some of these effects by treating the typhoon impact as a macro shock. In order to do so, we use macroeconomic projections of the effects of the typhoons on output and employment to determine the household-level impacts. The baseline scenarios for 2009 and 2010 are the crisis scenarios as calculated by the model. Thus, we are able to determine the cumulative impact of the typhoons and the financial crisis as compared to 2006.

Table 3a shows the poverty impacts of the typhoons according to this methodology. Poverty is expected to increase by 0.5 percentage points in 2009 and 0.7 percentage points in 2010. The increase according to the Poverty gap is larger in 2010 than in 2009. The impact on inequality, however, is negligible.

Table 3a: Poverty and inequality impacts of the typhoon

		2009			2010		
	2006	Base (1)	Typhoon (2)	Diff (2)-(1)	Base (1)	Typhoon (2)	Diff (2)-(1)
Moderate poverty							
-Headcount rate	33.2	32.4	32.9	0.53	32.4	33.0	0.66
-Poverty gap	10.2	10.3	10.6	0.33	10.7	10.8	0.11
Inequality per-cap. Exp							
-Gini	0.471	0.476	0.478	0.001	0.480	0.480	0.000

Notes: Baseline = economy growth on trend
Typhoon = Tyhpoon shock scenario

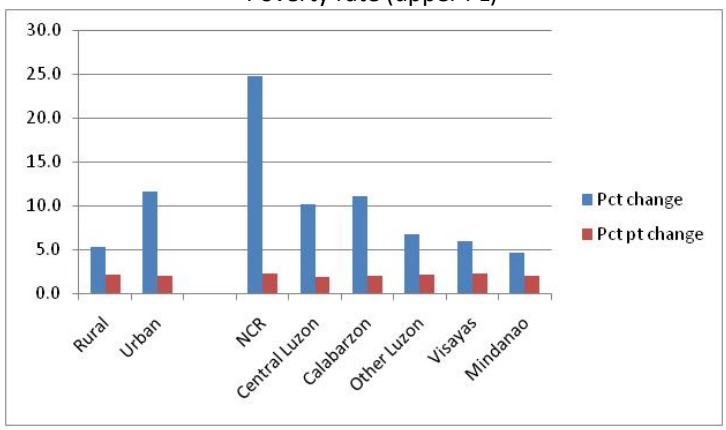
Source: Own estimations

These differences also manifest themselves in the aggregate rural-urban poverty impacts, with the urban poverty rate rising much more than the rural poverty rate relative to their corresponding benchmark poverty rates (11.5% and 5.2% rise for urban and rural poverty rates, respectively) due to the crisis (Figure 3). The income impact in urban areas is also much larger – average urban household income with crisis is 4.3% lower than that in the benchmark while average rural household income in crisis is 2.5% lower than in the benchmark (see Annex 2, Table D.1). This difference is driven mostly by a change in labor income, which would decline relatively more in urban areas (5.6% of the benchmark) than in rural areas (3.0% of the benchmark).

It is important to note that the absolute change in the poverty headcount rate is nearly identical across the regions and across urban and rural areas, at around 2 percentage points (Figure 3). The same absolute change in poverty headcount however translates into much higher *percentage* change in poverty in the richer, urbanized regions because these regions start with a lower headcount. Moreover, the same absolute increase in poverty rate would imply many more people in poverty in the denser, more urbanized areas than in the less densely populated areas of Other Luzon, Visayas, and Mindanao.

Figure 3: Change in poverty headcount due to the crisis in 2010

Poverty rate (upper PL)



Source: Own simulations based on FIES (2005). For projected poverty rates, see Annex 2, Table D.2.

Note: Vertical axis measures the difference between crisis and benchmark poverty rates (as % of benchmark rate)

However, even after taking into account the significantly higher impact of the crisis in the urban regions, the regional gaps in poverty and income levels would continue to remain large in 2010. This is because the gaps in 2006 – the baseline year for all the simulations – were large to start with (Figure 4 and Figure 5), and poverty reduction has been slow over the past few years. NCR, Calabarzon, and Central Luzon are projected to remain the (significantly) richer regions of the country, with Other Luzon, Visayas, and Mindanao remaining as the poor regions.

Figure 4: Poverty headcount rates for divisions (%)
2006 estimates & 2010 projections

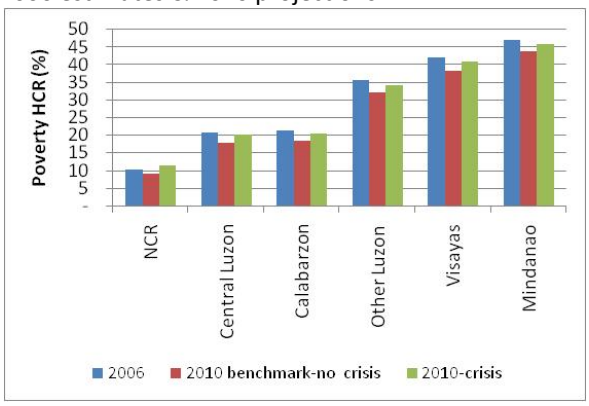
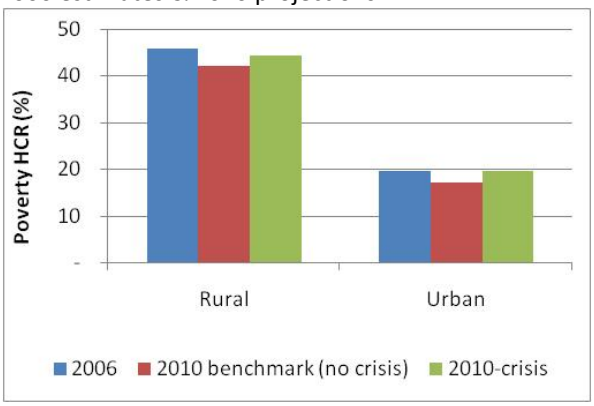


Figure 5: Poverty headcount rates for urban/rural
2006 estimates & 2010 projections



Source: Estimates and simulations based on FIES (2006)

Impact of the crisis by gender

According to the simulation results, poverty will increase relatively more among female-headed households than among male-headed households due to the crisis – the impact on the headcount is 11.9% versus 7.6% in 2010 (Table 4). Poverty rates will continue to be significantly lower among female-headed households. These differences can be attributed to slightly higher declines in employment (across all sectors, but especially in services) and average household labor income among female-headed households.

In general, labor income is more negatively impacted for female-headed households – in aggregate (household) terms as well as in terms of average earning per worker (Table 4). In 2009, this is mostly due to a larger loss in manufacturing earnings, whereas in 2010 the impact is distributed more evenly across sectors.

Table 4: Crisis Impacts by Gender
(% change between benchmark and crisis)

	2009		2010	
	Female	Male	Female	Male
Income				
Labor Income	-4.4	-2.7	-6.1	-4.4
Remittances	-0.4	-0.6	-1.5	-3.0
Foreign	0.2	0.5	-0.7	-2.1
Domestic	-3.2	-3.2	-4.9	-4.9
Earnings				
Mean per Worker	-2.6	-1.9	-4.1	-2.7
Agriculture	-1.1	-1.5	-1.4	-1.8
Manufacturing	-9.5	-10.9	-12.8	-12.9
Other Industries	4.4	5.0	7.4	7.4
Services	-1.8	-1.2	-2.9	-2.0
Poverty				
Poverty Headcount	8.3	5.3	11.9	7.6
Poverty Gap	11.2	8.2	16.3	12.5

Source: Estimates and Simulations based on FIES (2005)

Distributional impact of the crisis: Going beyond poverty and inequality indices

By generating predicted levels of income and consumption for all households in benchmark *and* crisis scenarios, our simulation model allows us to examine the type of households that are likely to be affected by the crisis, the primary channels of impact and their relative importance, and the distribution of the impact across different income groups. Here we present the results from three types of analysis

that have been selected primarily for illustrative purposes. We also present the results for 2010 only, when the relatively larger impact of the crisis is expected.

Firstly, we examine the characteristics of the group we will call "crisis-vulnerable", which refers to households that would *not* have been poor in 2010 had there been no crisis. *Secondly*, we will use the well-known analytical device of growth incidence curves to see how change in income, as a result of the crisis, is distributed across income groups and between urban/rural areas and regions. *Thirdly*, we will construct a few transition matrices to look at upward and downward movement of households as a result of the crisis, compared to the benchmark. These are but examples of what is possible in the way of distributional analysis with the results of our model; the choice of what type of analytics needs to be done for a certain country would depend on the specific country context and policy concerns.

A profile of the "crisis-vulnerable". Households that are expected to be in poverty in the crisis scenario but not in the benchmark scenario in 2010, termed as the "crisis-vulnerable", are projected to suffer large income losses due to the crisis, relative to the benchmark scenario – with a 39% drop in average household income, which translates to a 45% loss in per capita income. Most of this loss is due to a massive loss in labor income, amounting to 48% of the benchmark income. Remittances are less important as a component of the overall income loss of the "crisis-vulnerable" households. Although there is a 33% loss in remittance income for households conditional on receiving remittances in the first place, the absolute amounts are too small to have a significant impact on poverty.

The key characteristics of crisis-vulnerable households, relative to the rest of the population, are as follows (see Annex 2, Table E for all results). Comparing the crisis-vulnerable to the overall population, the crisis-vulnerable are slightly more rural (57.1% as compared to the overall figure of 51.5%), have slightly larger household sizes (5.1 people per household as compared to the national average of 4.8) and have nearly identical dependency ratios. The crisis-vulnerable have lower skills on average – 67.3% of household heads have education 0-9 years compared to the national average of 55.9%. Although the employment rates are very similar among the two groups, the sectoral composition is quite different. Crisis-vulnerable household heads are more likely to be employed in agriculture and manufacturing, and less likely to be employed in services or other industry. This result further underscores our initial assertion that the shock is likely to manifest itself through lack of demand for exports in the manufacturing sector and commodity price decreases in the agricultural sector.

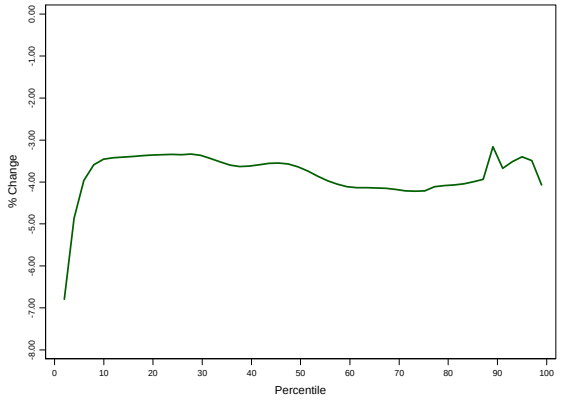
It is also interesting to look at how these crisis-vulnerable households compare with the permanently or *structurally poor* (defined as the households who are poor in *both* benchmark and crisis scenarios in 2010). In general, structurally poor households are larger, have higher dependency and are lower skilled. They are also far more likely to be employed in agriculture (64.0% of the structurally poor as opposed to 36.9% of the crisis-vulnerable), and subsequently less likely to be employed in manufacturing (4.8% as compared to 11.3%) or services (27.4% as compared to 48.5%). This is understandable since those employed in manufacturing tend to be better off in general, even though they are the demographic most likely to be worse off as a result of the crisis. The crisis-vulnerable households are also significantly less rural than the structurally poor households (see Annex 2, Table E).

The profile of crisis-vulnerable households is consistent with our *a priori* intuition. The reduction in labor income is the primary channel of impact for households that are predicted to become poor as a direct result of the crisis. Compared to the general population, households vulnerable to the crisis are disproportionately employed in manufacturing because output and income losses are expected to occur in these sectors. They are also less skilled than the general population, but quite similar in terms of dependency, household size, and rural-urban composition.

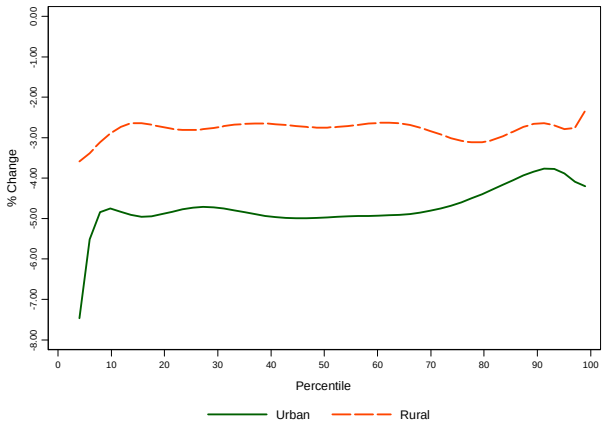
The crisis-vulnerable or the "newly poor" households as a result of the crisis are also different in a number of key aspects from the more permanently poor. Compared to the structurally poor, they have "better" characteristics (lower dependency, higher skills, living in urban areas and employed outside agriculture) – characteristics that our simulations indicate would have taken them out of poverty had there been no crisis.

Figure 6: Growth incidence curves (crisis vs. benchmark, 2010)

(a) Per capita income: Philippines



(b) Per capita income: urban and rural



Source: Own simulations based on FIES (2006)
Note: 1) GICs have been smoothed to eliminate sharp kinks in the original curves
2) Percentiles of income on the horizontal axis are for the relevant group (all country, urban, rural, etc.)

How income losses between benchmark and crisis scenarios are distributed. This analysis is similar to the familiar growth incidence curves (GICs), in examining how the changes in per capita income between benchmark and crisis scenarios in 2010 vary across the income distribution. GICs are commonly used to look at the distribution of growth over time; however the same device is useful to see changes between two "states" of the world as well, in this case the benchmark (no-crisis) and crisis states for the same point in time. A GIC in this case will plot the percentage change in per capita income between 2010 benchmark and crisis scenarios for every centile (1% of the population) in the benchmark distribution of per capita income (when the households are ordered by per capita income).

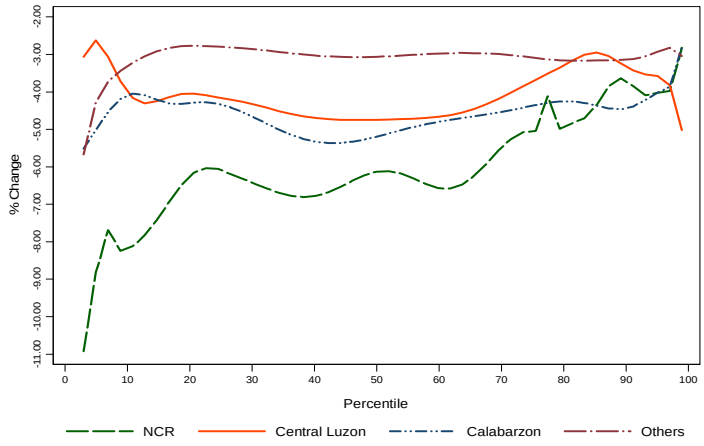
For the country overall, the GIC of loss in per capita income (as a percentage of the benchmark income) shows significant losses (ranging from 3% to just above 4%) for households the 10th and 90th percentiles of the income distribution (Figure 6a). The largest losses (4-7%) occur for the bottom 10 percent of the distribution, but this finding is of less significance since the errors in measuring income can be high for

the lowest and highest ranges of the distribution. More significant is the fact that the losses are higher for 50th and 90th percentiles than for the 10th to 50th percentiles, indicating that the middle and upper middle classes suffer somewhat higher losses than poorer groups (with the exception of the bottom decile).

Looking at how the impact is distributed *within* urban and rural areas, there are some important differences between the two areas (Figure 6b). The urban incidence curve shows higher impacts for the bottom 10% of the distribution and lower impacts above the 70th percentile, while the rural incidence curve is quite flat, with marginally higher impacts seen only for some of the poorest (below 10th percentile) and wealthy (70th to 90th percentile) groups. It is important to note that the percentiles of expenditures are defined with reference to each area (urban or rural). Since urban areas are better off on the average than rural areas, the kth percentile of urban households is better off than (and thus not strictly comparable with) the kth percentile of rural households.

These results imply that the urban poor, near-poor and middle-class (up to the 70th percentile of the urban distribution) are more adversely affected than richer urban households, while the impacts are more evenly distributed among rural households. Notably, the impact is significantly higher among urban households than among rural households for the entire range of the distribution, consistent with earlier results showing that the poverty impact is relatively higher in urban areas (refer to Figure 3).

Figure 7: Regional growth incidence curve (crisis vs. benchmark, 2010)
Per capita income: Philippines



Source: Own simulations based on FIES (2006)
Note: 1) GICs have been smoothed to eliminate sharp kinks in the original curves
2) Percentiles of income on the horizontal axis are applicable to the relevant group (in this case, region)

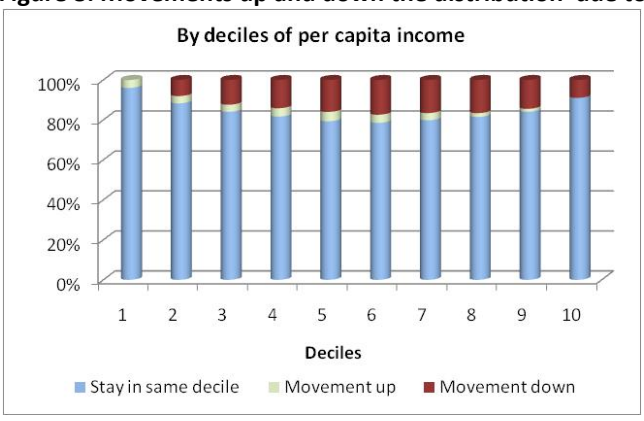
The regional GIC (Figure 7) reinforces our earlier result about urban poverty in the NCR, Central Luzon, and Calabarzon. Especially in NCR, the poorest are by far the worst affected, with the effects sharply declining as one moves to the top of the income distribution. Calabarzon shows a similar trajectory, although there the middle class and the poor appear to face similar impacts, and in Central Luzon, it is primarily the middle class who bear the brunt of the crisis.

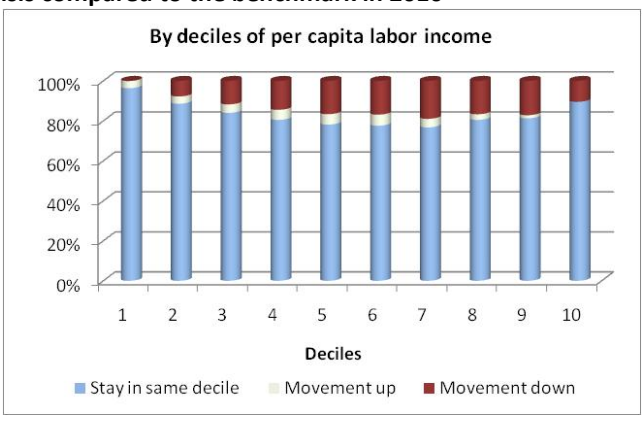
Movements of households up or down the distribution due to the crisis. The GICs described above provide a clear picture of the *incidence* of the losses in income due to the crisis across the entire distribution. They also lead to some important follow-up questions from a distributional perspective: where would the households suffering these losses end up *relative* to other households as a result of the crisis, and what is the extent of "churning" that occurs in the distribution as a result of the crisis? Transition matrices are useful to address such questions, by indicating movements up or down the income distribution between the crisis and benchmark scenarios. These matrices are constructed for deciles of per capita income and labor income, keeping the *upper and lower limits of each decile fixed at the 2010 benchmark income levels*. This implies that movements up or down by households in these matrices reflect the shifts that occur as a result of the crisis, relative to the *benchmark* (no-crisis) income distribution (see Annex 2, Table F).

Figure 8 shows the share of households in each decile that (i) remain in the same decile, (ii) move up to a higher decile or (iii) move down to a lower decile as a result of the crisis. Summing across all deciles, 84.5% of households are found to remain in the same decile by per capita income, while 83.4% do so for deciles by per capita *labor* income. Given that the deciles are fixed at the benchmark level and the crisis yields an overall loss of income, movements down are much more common than movements up.

The most significant downward movements occur for households in the middle of the distribution, namely in the 5th-8th deciles by per capita total income, with the largest movement occurring for those in the 7th decile. The movements between deciles of per capita *labor* income are smaller, with the largest movements occurring for the 7th and 8th deciles. Upward movements are extremely rare.

Figure 8: Movements up and down the distribution due to crisis compared to the benchmark in 2010





Source: Own simulations based on FIES (2006)

Thus the highest amount of "churning" occurs in the middle part of the distribution (5th to 8th deciles), with downward movements being more common for the middle and upper-middle class *relative* to the poor and the richest. Between 15.5% and 17.5% of households in the 5th to 8th deciles of per capita income move down to a lower decile as a result of the crisis. Labor income losses (that are significant enough to lead to downward movements) show a very similar outcome to the total income losses, because, as discussed earlier, they are the largest drivers of overall income loss.

5. Conclusion: Implications of our results

Even with the caveats and limitations discussed in Section 3, our model appears to yield reasonable and intuitively appealing results, based on a transparent and flexible approach using macro projections and household survey data that are typically available in a developing country. The value that our model *adds* to the simpler models (e.g. POVSTAT or elasticity based methods that are most commonly used in the World Bank) is the ability to analyze potential distributional impacts in detail, linking these changes to the channels through which the impact of the crisis is likely to flow. The application of our model to Philippines yields some useful insights relevant to the country, in three main areas discussed below: monitoring of impacts of the crisis, providing deeper insights into who are likely to be affected by the crisis, and how that in turn can inform the design of policies to mitigate impacts.

Firstly, our results suggest that in the Philippines, a select few indicators are prime candidates to monitor as "leading" or real-time indicators for the poverty and distributional impact of the financial crisis, or of future shocks with macroeconomic impacts similar to this crisis. To be useful for rapid monitoring of poverty and distributional impacts, the indicators must be easily obtained and measurable, sensitive to changes in economic conditions, and correlated with changes in poverty and distribution. By these criteria, movement of *wages and employment in manufacturing and services*, changes in *remittance flows from abroad* and the movement of *prices* (particularly food prices) can serve as useful indicators for rapid monitoring of economic shocks in Philippines. It is important to notice, however, that data on wages is only collected in the October round of the Labor Force survey and made available with a large time gap. Inclusion of monitoring questions on wages in other LFS quarters, together with timelier processing and publication of the information could significantly enhance the government's capacity to monitor potential poverty and distributional impacts of macroeconomic shocks.

Why these indicators? From our analysis, the labor market emerges as the major source of impact in Philippines, with the effects being transmitted through loss of employment in certain sectors (primarily manufacturing) and lower labor earnings as output growth slows. Another channel of impact is remittance flows, since remittance growth in 2010 is expected to fall below what was expected before the crisis had occurred. Any rapid, unexpected change in food (mainly rice) prices could also have a significant impact on poverty – at least in the short-run when wages would lag behind food prices. These indicators also have the advantage of being relatively easy to monitor – with administrative or financial data (for aggregate remittance flows), and quick market or household surveys (prices and wages).

Tracking wages as a part of rapid monitoring would be particularly important. First, growth slowdown in a country like Philippines is more likely to be manifested in lower earnings rather than open unemployment – a hypothesis supported by our results as well. Second, while wages represent only a *part* of the labor earnings from a sector, wages are much easier to track (e.g. through quarterly labor force or quick enterprise surveys) than income from household enterprises and self-employment. Wages are also likely to be reasonably correlated with broader measures of labor income, particularly in the manufacturing sector where most of the labor market impact is expected.

Secondly, our results indicate that just focusing on poverty numbers would provide a partial view of the distributional impact of the crisis in Philippines. It is useful here to revisit some of the key distributional results. The adverse impact on income, while occurring throughout the income distribution, is somewhat larger for those in the 50^{th} to 90^{th} percentile of the national distribution – a group that can be characterized as the middle-class. Also, underlying the national results are important urban-rural and spatial differences in the magnitude and distribution of the impact. Urban households are projected to suffer relatively larger losses than rural households, with the result that income losses and poverty impact would be higher in regions that are more urbanized (NCR, Central Luzon and Calabarzon). Within urban areas the incidence of loss would be higher for the poor and the middle-class (the bottom 70 percent of the urban distribution), while rural losses are more evenly distributed.

Thus the urban poor and near-poor would appear to be key groups of concern from a public policy perspective, as the groups most likely to slip into (or deeper into) poverty. While public programs would have little role to play in directly mitigating the losses suffered by the middle and upper-middle classes, these losses may have important political economy implications. The fact that the impact is relatively high for the urban middle-class (40^{th} - 70^{th} percentile of the urban distribution) could be particularly significant from a political economy perspective.

Finally, our results provide useful insights on the *types* of households who are likely to be poor as a *direct* result of the crisis. Such households are found to have characteristics somewhat different from those of the structurally poor – more likely than the structurally poor to be urban and employed in non-agricultural sectors, and with higher skills and fewer dependents in households. This would imply that any intervention to mitigate the impact of the crisis on vulnerable households would need to be modified (or designed differently) from that of the traditional safety net programs. Also, the income and poverty impacts are somewhat higher for households headed by women than for those headed by men. While more analysis needs to be done to fully understand the source of this gender difference, the seemingly higher vulnerability of female-headed households to the crisis is important to take into account in gauging the impact of the crisis and considering policy responses.

Apart from these somewhat general statements, a discussion of what kinds of public policies and programs are best suited to mitigate the impact of such a macroeconomic shock in Philippines is beyond the scope of this paper. The results from our simulation exercise, however, can be useful in informing such discussions, at least till the time when actual survey data become available on who are being impacted by the macroeconomic shock and to what extent.

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Annex 1

OCCUPATIONAL DECISION MODEL FOR THE PHILIPPINES

Individuals between 15 and 64 years old

	Low skills (*)					High skills (**)				
	Unemployed	Agric	Manuf.	Other Ind. (1)	Services	Unemployed	Agric	Manuf.	Other Ind. (1)	Services
male	1.000***	2.132***	1.073***	4.200***	0.187**	1.095***	2.444***	0.789***	4.713***	0.669***
	(0.122)	(0.0846)	(0.148)	(0.512)	(0.0915)	(0.0933)	(0.101)	(0.103)	(0.319)	(0.0773)
hhead	-1.351***	0.664***	0.584***	0.0696	0.587***	-1.898***	0.817***	1.213***	-0.131	0.885***
	(0.294)	(0.145)	(0.224)	(1.116)	(0.135)	(0.381)	(0.224)	(0.194)	(0.800)	(0.146)
age	0.0737***	0.190***	0.235***	0.322***	0.231***	0.106***	0.304***	0.360***	0.426***	0.339***
	(0.0112)	(0.00795)	(0.0132)	(0.0149)	(0.00823)	(0.0119)	(0.0117)	(0.0137)	(0.0181)	(0.00895)
age2	-0.000855***	-0.00218***	-0.00285***	-0.00401***	-0.00274***	-0.00163***	-0.00360***	-0.00479***	-0.00531***	-0.00424***
	(0.000142)	(9.77e-05)	(0.000163)	(0.000185)	(0.000101)	(0.000157)	(0.000149)	(0.000179)	(0.000229)	(0.000114)
pric	-0.171*	-0.201***	0.175*	-0.688	0.224***					
	(0.0941)	(0.0464)	(0.0898)	(0.478)	(0.0479)					
seci	0.0173	-0.422***	0.292***	0.0555	0.286***					
	(0.0912)	(0.0507)	(0.0925)	(0.405)	(0.0493)					
gen_pric	0.234*	0.249***	0.155	1.089**	0.152*					
	(0.132)	(0.0852)	(0.133)	(0.486)	(0.0915)					
gen_seci	-0.00931	-0.0579	0.0581	0.210	0.162*					
	(0.121)	(0.0795)	(0.128)	(0.413)	(0.0833)					
married	-2.215***	-0.728***	-1.044***	-1.332***	-1.294***	-2.356***	-1.235***	-1.752***	-1.723***	-1.670***
	(0.0897)	(0.0643)	(0.108)	(0.468)	(0.0595)	(0.0693)	(0.0807)	(0.0741)	(0.238)	(0.0495)
remitt	0.231***	-0.0230	0.0600	-0.275	0.109***	0.168***	-0.00462	-0.102*	-0.445**	-0.0476
	(0.0809)	(0.0414)	(0.0769)	(0.389)	(0.0405)	(0.0601)	(0.0621)	(0.0617)	(0.226)	(0.0370)
depen	-1.091***	0.334***	0.0128	0.429***	0.343***	-1.186***	0.234**	-0.217**	0.347**	0.145**
	(0.114)	(0.0710)	(0.119)	(0.128)	(0.0737)	(0.101)	(0.0945)	(0.107)	(0.136)	(0.0717)
perce	-0.00566	3.626***	4.658***	4.446***	4.439***	-0.000885	4.497***	5.714***	5.711***	5.379***
	(0.0856)	(0.0640)	(0.106)	(0.112)	(0.0677)	(0.0784)	(0.0861)	(0.0980)	(0.121)	(0.0684)
oth_pub	0.0682	-1.318***	-1.051***	-1.126***	0.113*	0.0260	-1.241***	-1.105***	-1.139***	0.0563
	(0.0963)	(0.0709)	(0.126)	(0.133)	(0.0594)	(0.0635)	(0.0677)	(0.0817)	(0.102)	(0.0427)
enrolled	-4.237***	-2.628***	-3.274***	-4.512***	-2.868***	-4.641***	-3.002***	-3.787***	-3.952***	-3.129***
	(0.140)	(0.0638)	(0.170)	(0.343)	(0.0755)	(0.132)	(0.101)	(0.177)	(0.312)	(0.0686)
gen_hhd	1.012***	0.748***	1.335***	1.923*	1.506***	0.702	0.0457	0.469	1.576*	0.811***
	(0.381)	(0.241)	(0.330)	(1.138)	(0.242)	(0.444)	(0.301)	(0.292)	(0.832)	(0.232)
gen_rem	-0.193*	-0.0914	-0.186	0.103	-0.119	-0.151	0.124	0.0242	0.475*	0.105
	(0.113)	(0.0717)	(0.127)	(0.400)	(0.0809)	(0.0960)	(0.0986)	(0.110)	(0.246)	(0.0785)
hhd_rem	-0.0286	0.0705	0.249	1.103	-0.0491	0.728*	-0.199	-0.461**	0.204	-0.134
	(0.321)	(0.156)	(0.237)	(1.194)	(0.144)	(0.405)	(0.251)	(0.225)	(0.917)	(0.156)
gen_hhd_rem	-0.123	-0.487**	-0.885***	-1.589	-0.528***	-0.407	-0.171	0.0302	-0.566	-0.282
	(0.366)	(0.203)	(0.290)	(1.204)	(0.199)	(0.437)	(0.284)	(0.269)	(0.929)	(0.199)
hhd_married	1.602***	0.192	0.626**	0.632	0.638***	0.735***	0.610***	0.463**	1.365	0.757***
	(0.347)	(0.191)	(0.269)	(1.225)	(0.164)	(0.277)	(0.228)	(0.221)	(0.843)	(0.133)
gen_married	2.587***	1.373***	1.941***	2.364***	2.399***	2.540***	1.367***	2.447***	2.390***	2.385***
	(0.176)	(0.143)	(0.192)	(0.490)	(0.144)	(0.120)	(0.127)	(0.131)	(0.262)	(0.103)
hhd_marr_gen	-1.797***	-0.695**	-1.636***	-1.775	-1.872***	-0.664*	-0.691**	-1.294***	-2.095**	-1.677***
	(0.442)	(0.294)	(0.390)	(1.252)	(0.284)	(0.362)	(0.314)	(0.324)	(0.878)	(0.235)
urban	0.115**	-1.381***	-0.00443	0.0800	0.283***	0.0968**	-1.406***	0.179***	-0.139**	0.0680**
	(0.0556)	(0.0377)	(0.0556)	(0.0594)	(0.0353)	(0.0477)	(0.0446)	(0.0514)	(0.0628)	(0.0338)
supi						0.199***	-0.293***	-0.178**	0.851**	0.128***
						(0.0669)	(0.0693)	(0.0708)	(0.336)	(0.0412)
supc						0.835***	-0.567***	0.199***	2.328***	1.190***
						(0.0708)	(0.0929)	(0.0768)	(0.282)	(0.0448)
gen_supi						-0.444***	-0.697***	-0.576***	-1.839***	-0.582***
						(0.0969)	(0.0955)	(0.105)	(0.345)	(0.0725)
gen_supc						-0.563***	-0.621***	-0.581***	-3.347***	-1.073***
						(0.114)	(0.132)	(0.125)	(0.301)	(0.0921)
Constant	-1.834***	-7.109***	-7.243***	-11.61***	-5.484***	-1.543***	-9.935***	-8.016***	-13.51***	-6.493***
	(0.220)	(0.225)	(0.269)	(0.575)	(0.161)	(0.203)	(0.274)	(0.242)	(0.446)	(0.160)
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55315	55315	55315	55315	55315	54842	54842	54842	54842	54842
Pseudo R2	0.314	0.314	0.314	0.314	0.314	0.316	0.316	0.316	0.316	0.316

Notes: National Capital Region (NCR) is the base region; Inactive is the base category

(1) Other industries include Mining & quarrying; Electricity, Gas & Water and Construction

(*) Low skills includes individuals with completed secondary school; (**) High skills includes individuals without a secondary school education

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Own estimations based on FIES 2006

Variable definitions for Occupational Decision Model

Variable	Definition
male	=1 if male
hhead	=1 if household head
age	Age of the individual
age2	Age squared
pric	=1 if primary education completed
seci	=1 if secondary education incomplete
married	=1 if married
remitt	=1 if household receives remittances (foreign or domestic)
depen	dependency ratio between number of members <15 or >64 and total number of members in the household
perce	ratio between number of income preceptors in the household -1 and the number of potential income preceptors within the hhd
oth_pub	=1 if there is another member of the household with a public job
enrolled	=1 if individual is currently attending school
urban	=1 if living in an urban area
supi	=1 if teritary education incomplete
supc	=1 if tertiary education complete
gen_pric; gen_seci; gen_hhd; gen_rem; hhd_rem; gen_hhd_rem; hhd_married; gen_married; hhd_marr_gen; gen_supi; gen_supc	Interaction terms

LOG EARNING EQUATIONS (Individuals between 15 and 64 years old)

	Low skills (*)				High skills (**)			
	Agric	Manuf.	Other Ind. (1)	Services	Agric	Manuf.	Other Ind. (1)	Services
male	0.497***	0.356***	0.399**	0.322***	0.425***	0.128***	-0.394***	0.120***
	(0.0272)	(0.0646)	(0.174)	(0.0297)	(0.0471)	(0.0368)	(0.104)	(0.0174)
hhead	0.439***	0.182**	0.949**	0.210***	0.131	0.0560	-0.156	0.0618**
	(0.0413)	(0.0887)	(0.388)	(0.0346)	(0.0916)	(0.0704)	(0.319)	(0.0261)
age	0.0810***	0.0884***	0.0727***	0.0725***	0.106***	0.0780***	0.0758***	0.0726***
	(0.00368)	(0.0102)	(0.0102)	(0.00450)	(0.00821)	(0.00857)	(0.0123)	(0.00371)
age2	-0.00102***	-0.00108***	-0.000887***	-0.000832***	-0.00129***	-0.000914***	-0.000878***	-0.000760***
	(4.37e-05)	(0.000125)	(0.000126)	(5.49e-05)	(0.000102)	(0.000114)	(0.000157)	(4.69e-05)
pric	0.0816***	0.248***	0.104**	0.104***				
	(0.0165)	(0.0523)	(0.0429)	(0.0229)				
seci	0.0974***	0.325***	0.222***	0.183***				
	(0.0192)	(0.0521)	(0.0435)	(0.0228)				
supi					0.209***	0.144***	0.136***	0.223***
					(0.0345)	(0.0346)	(0.0452)	(0.0159)
supc					0.535***	0.736***	0.953***	0.916***
					(0.0512)	(0.0380)	(0.0581)	(0.0151)
urban	-0.0228	0.217***	0.0518	0.0273	0.00687	0.169***	0.0772*	0.00941
	(0.0211)	(0.0466)	(0.0381)	(0.0198)	(0.0353)	(0.0359)	(0.0417)	(0.0146)
pub_job				-0.144***				0.0608***
				(0.0391)				(0.0195)
sala	-0.279***	0.315***	0.662***	-0.107***	-0.280***	0.479***	0.395***	0.306***
	(0.0165)	(0.0497)	(0.0574)	(0.0195)	(0.0335)	(0.0445)	(0.0658)	(0.0150)
gen_hhd	0.0925**	0.403***	-0.463	0.207***	0.274***	0.361***	0.726**	0.334***
	(0.0463)	(0.106)	(0.389)	(0.0449)	(0.0974)	(0.0789)	(0.322)	(0.0314)
Constant	5.927***	5.668***	5.845***	6.484***	6.035***	6.463***	6.849***	6.651***
	(0.173)	(0.220)	(0.262)	(0.0975)	(0.251)	(0.164)	(0.259)	(0.0737)
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15757	2076	2120	10075	5057	3530	1945	20940
R-squared	0.278	0.318	0.262	0.198	0.240	0.289	0.327	0.301
Adj R-squared	0.277	0.310	0.253	0.195	0.236	0.284	0.318	0.300

Notes: National Capital Region (NCR) is the base region

(1) Other industries include Mining & quarrying; Electricity, Gas & Water and Construction

(*) Low skills includes individuals with completed secondary school; (**) High skills includes individuals without a secondary school education

For low-skilled workers, primary incomplete is the base level; For high-skilled workers, secondary complete is the base level

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Own estimations based on FIES 2006

Variable definitions for Earning Equation

Variable	Definition
male	=1 if male
hhead	=1 if household head
age	Age of the individual
age2	Age squared
pric	=1 if primary education completed
seci	=1 if secondary education incomplete
supi	=1 if teritary education incomplete
supc	=1 if tertiary education complete
urban	=1 if living in an urban area
pub_job	=1 if individual works in the public sector (govt. org., public factory, or local govt.)
sala	=1 if individual is a salaried worker
gen_hhd	=1 if male and household head

Annex 2

Table A.1: POPULATION GROWTH CHANGE

(in millions)

		0-14	15-64	+65	Total
2006	Total	30.15	53.18	3.60	86.93
	Male	15.40	26.71	1.60	43.72
	Female	14.74	26.46	2.00	43.20
2009	Total	30.90	57.33	3.94	92.17
	Male	15.79	28.80	1.75	46.34
	Female	15.12	28.53	2.18	45.83
2010	Total	31.16	58.80	4.06	94.01
	Male	15.91	29.54	1.81	47.26
	Female	15.24	29.26	2.25	46.75
Δ%	Total	3.35	10.56	12.79	8.15
	Male	3.32	10.59	12.94	8.11
	Female	3.38	10.56	12.76	8.21

Source:National Statistics Office. 2000 Census-based Population Projection collaboration with the Inter-AgenWorking Group on Population Projections

Table A.2: SECTORAL OUTPUT GROWTH CHANGE

(Base: 1985 = 100; Pesos in Millions)

		2006	Benchmark		Crisis	
			2009	2010	2009	2010
TOTAL		1,276,156	1,485,526	1,559,412	1,438,056	1,482,592
GDP in constant prices	Agriculture	239,777	267,215	275,274	262,312	268,136
	Manufacturing	305,663	342,490	356,874	308,899	311,988
	Other Industries	109,152	144,746	154,507	152,108	165,122
	Services	621,564	731,075	772,757	714,736	737,345
Annual Growth rate	Total	5.40	4.69	4.97	1.35	3.10
	Agriculture	3.70	3.01	3.02	1.12	2.22
	Manufacturing	4.60	4.00	4.20	(6.20)	1.00
	Other Industries	5.41	6.67	6.74	12.09	8.56
	Services	6.47	5.26	5.70	2.91	3.16
Remittances (USD Billions nominal)		12.7	17.9	19.5	17.1	18.0

Source: NSO - GDP of Philippines and Projections

Table A.3: EMPLOYMENT SECTORAL GROWTH CHANGE

Individuals >15 & < 64 years old

	2006		Benchmark				Crisis			
			2009		2010		2009		2010	
	Millions	%	Millions	%	Millions	%	Millions	%	Millions	%
Total	51.1		55.1		56.5		55.1		56.5	
Inactive	16.1	31.5	17.9	32.4	18.6	33.0	17.7	32.0	18.3	32.4
Unemploye	3.2	9.1	3.2	8.6	3.2	8.4	3.9	10.3	4.3	11.2
Employed	31.4	90.9	34.0	91.4	34.7	91.6	33.7	89.7	34.1	88.8
Agriculture	10.6	33.8	11.3	33.2	11.5	33.1	11.2	33.2	11.3	33.2
Manufactu	3.0	9.5	2.9	8.5	2.9	8.4	2.9	8.7	2.9	8.6
Other Indus	1.9	6.1	2.1	6.3	2.1	6.1	2.1	6.3	2.1	6.1
Services	15.9	50.6	17.7	52.1	18.2	52.6	17.5	51.9	17.8	52.2

Source: NSO - GDP of Philippines and Projections

Table B- DEMOGRAPHIC, HOUSEHOLD INCOME & LABOR MARKET OVERVIEW

	2006		2009				2010			
			Benchmark		Crisis		Benchmark		Crisis	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Population (million)										
- Total	41.4	42.0	44.0	44.6	44.0	44.6	44.9	45.4	44.9	45.4
- Urban	20.5	20.1	21.8	21.3	21.8	21.3	22.2	21.7	22.2	21.7
- Working-age [1]	25.4	25.7	27.4	27.7	27.4	27.7	28.1	28.5	28.1	28.5
Household Income ($/month) [2]										
- Total	19,441.0	16,803.4	19,975.6	17,808.0	19,504.0	17,431.2	20,272.8	18,130.9	19,558.2	17,475.9
- Labor income [3]	9,207.0	12,132.8	9,740.3	13,038.7	9,307.8	12,682.2	9,929.9	13,317.6	9,328.9	12,732.1
- Non-labor income [4]	8,145.4	3,153.5	8,146.8	3,244.9	8,107.6	3,224.6	8,254.3	3,286.4	8,140.8	3,216.8
Remittances	6,158.5	1,743.6	6,128.1	1,807.8	6,103.6	1,797.1	6,225.8	1,840.7	6,135.3	1,786.1
-Abroad	5,156.2	1,243.3	5,071.2	1,274.7	5,080.4	1,281.1	5,152.6	1,297.5	5,114.9	1,269.7
-Domestic	1,002.2	500.3	2,085.9	1,172.1	2,019.2	1,134.6	2,117.4	1,194.1	2,013.1	1,135.2
- Implicit rent	2,088.6	1,517.1	2,088.5	1,524.5	2,088.5	1,524.5	2,088.5	1,526.9	2,088.5	1,526.9
Working-age (million) [1]										
I. Labor Force	24.5	24.9	26.5	26.8	26.5	26.8	27.1	27.5	27.1	27.5
Inactive	10.9	3.9	12.2	4.4	12.0	4.3	12.8	4.6	12.5	4.5
Active	13.7	20.9	14.3	22.4	14.5	22.5	14.4	22.9	14.7	23.0
Unemployed	1.3	1.9	1.3	1.9	1.5	2.3	1.3	1.9	1.7	2.6
Employed	12.6	19.3	13.0	20.5	13.0	20.2	13.1	21.0	13.0	20.4
Economic sectors	12.4	19.1	13.0	20.5	13.0	20.2	13.1	21.0	13.0	20.4
Agriculture	2.7	7.9	2.8	8.3	2.8	8.2	2.8	8.5	2.8	8.3
Manufacturing	1.3	1.7	1.2	1.7	1.2	1.7	1.2	1.7	1.2	1.7
Other industries	0.1	1.9	0.1	2.0	0.1	2.0	0.1	2.0	0.1	2.0
Services	8.2	7.7	8.9	8.5	8.9	8.3	9.1	8.8	8.9	8.5
II. Earnings ($/month)										
Mean per worker [5]	5,876.2	6,457.7	6,353.0	7,116.9	6,188.1	6,978.9	6,497.4	7,304.2	6,233.2	7,108.1
Economic sectors										
Agriculture	1,934.4	3,743.4	2,016.2	3,935.6	1,993.3	3,875.5	2,032.0	3,962.8	2,004.1	3,893.5
Manufacturing	6,182.5	8,139.5	6,897.3	9,557.8	6,239.0	8,514.5	7,165.5	9,889.2	6,245.5	8,609.0
Other industries	12,327.1	6,863.7	15,675.0	8,552.1	16,365.4	8,975.6	16,366.4	8,978.4	17,572.3	9,641.6
Services	7,233.9	8,855.2	7,733.1	9,470.6	7,594.3	9,356.5	7,928.5	9,713.9	7,698.2	9,518.0

Notes: (1) Individuals in 15-64 age category

(2) Refers to female vs male household heads

(3) Labor earnings from all activities

(4) Includes capital(rent land, property, profits, etc), remittances, social(insurances, charity, etc) and other non-labor incomes

(5) Refers to female vs male total workers

Source: Own estimations based on FIES 2006 and projections

Table C- FOOD PRICES COMPARED TO OVERALL CPI

(Base 2006 = 100)

	CPI		
	General	Food	Non-Food
	(1)	(2)	(3)
2006	100.00	100.00	100.00
Benchmark			
2009	113.14	113.65	112.63
2010	118.80	119.33	118.26
Crisis			
2009	116.03	122.70	109.99
2010	121.25	128.22	114.94

Weight of food in CPI and Poverty Line (PL)

CPI	Food	50.03
	Non-food	49.97
PL NCR	Food	57.41
	Non-food	42.59
Benchmark		
- variation in PL '09		0.07
- variation in PL '10		0.07
Crisis		
- variation in PL '09		1.08
- variation in PL '10		1.08

Source: NSO - Consumer Price Index (CPI) and Inflation Rate several reports

TABLE D- POVERTY IMPACT BY AREA & REGION

Table D.1: Household income (mean Pesos/month at constant 2006 prices)

Household Income (mean Pesos/month)

		TOTAL	AREA		REGION					
			Rural	Urban	NCR	Central Luzon	Calabarzon	Other Luzon	Visayas	Mindanao
Benchmark										
2010	Total income	18,508	13,575	23,089	27,122	20,179	20,861	15,312	16,700	14,610
	Labor income	12,721	9,413	15,698	18,985	13,241	14,304	10,028	10,955	10,867
	Remittances	2,612	1,799	3,380	3,239	3,768	3,453	2,300	2,654	1,317
Crisis										
2010	Total income	17,795	13,773	23,538	27,616	20,659	21,244	15,537	16,990	14,837
	Labor income	12,090	9,573	16,066	19,393	13,637	14,614	10,197	11,192	11,063
	Remittances	2,553	1,829	3,445	3,300	3,842	3,517	2,346	2,698	1,337
Loss of income with crisis (% of benchmark)		-3.9	1.5	1.9	1.8	2.4	1.8	1.5	1.7	1.5
Loss of labor income (% of benchmark)		-5.0	1.7	2.3	2.1	3.0	2.2	1.7	2.2	1.8
Loss of remittance (% of benchmark)		-2.3	1.7	1.9	1.9	2.0	1.9	2.0	1.7	1.6

TABLE E- PEOPLE WHO ARE POOR "DUE" TO CRISIS - 2010

Households characteristics	**Crisis-Vulnerable**	**Total**	**Structurally poor**
-Area			
Urban			
Rural (%)	57.1	51.5	73.1
- Members	5.12	4.82	5.87
- Dependency	0.39	0.38	0.49
- Employed (individuals Benchmark)	59.3	60.4	0.6
Agriculture	36.9	33.1	64.0
Manufacturing	11.3	8.4	4.8
Other industries	3.3	6.1	3.9
Services	48.5	52.4	27.4
Household income (Crisis-Vulnerable)	**Benchmark**	**Crisis**	
- Income (mean)			
Total Income	12,051.0	7,317.2	
Labor income	9,594.3	5,017.5	
Non-labor income	1,650.0	1,493.0	
- Remittances from abroad			
% of household receiving	15.1	13.7	
Mean conditional on receiving	380.2	253.8	
Implicit rent	806.6	806.6	
- Percapita Income (mean)	2,569.4	1,402.0	

Household head	**Crisis-Vulnerable**	**Total**	**Structurally poor**
- Age (mean)	46.10	47.69	45.65
- Male (%)	84.5	82.4	88.6
- Education level			
Low (%)	67.3	55.9	81.0

TABLE F- INCOME STATUS "CHANGES"

Table E.1: Transition matrix: Benchmark - Crisis

Per-capita income

		Crisis									
		1	2	3	4	5	6	7	8	9	10
Benchmark	1	**96.04**	1.84	0.55	0.48	0.21	0.34	0.29	0.14	0.12	-
	2	8.04	**88.32**	2.10	0.76	0.29	0.28	0.12	0.04	0.05	-
	3	1.76	10.60	**84.09**	2.28	0.41	0.34	0.30	0.06	0.16	-
	4	1.19	1.25	11.69	**81.69**	3.12	0.43	0.25	0.17	0.12	0.08
	5	1.16	0.80	0.86	13.15	**79.34**	3.39	0.60	0.43	0.25	0.01
	6	0.63	0.67	0.69	1.22	14.19	**78.58**	3.26	0.52	0.15	0.09
	7	0.59	0.29	0.60	0.90	1.71	12.47	**79.87**	2.78	0.75	0.04
	8	0.73	0.21	0.45	0.64	0.86	1.40	12.29	**81.50**	1.80	0.13
	9	0.40	0.25	0.19	0.21	0.42	1.10	1.60	10.23	**84.13**	1.47
	10	0.29	0.09	0.08	0.11	0.07	0.13	0.32	0.74	7.12	**91.04**

Table E.2: Transition matrix: Benchmark - Crisis

Per-capita Labor income

		Crisis									
		1	2	3	4	5	6	7	8	9	10
Benchmark	1	**96.39**	1.89	0.43	0.18	0.31	0.18	0.29	0.15	0.06	0.13
	2	7.75	**88.61**	2.06	0.49	0.45	0.15	0.14	0.23	0.07	0.05
	3	1.41	10.31	**84.04**	2.45	0.68	0.54	0.31	0.14	0.11	-
	4	1.08	0.64	12.71	**80.54**	3.46	0.55	0.39	0.47	0.15	-
	5	0.84	0.84	1.43	13.52	**78.2**	4.05	0.54	0.27	0.22	0.11
	6	0.48	0.60	0.77	0.72	14.29	**77.6**	3.88	0.76	0.65	0.22
	7	0.58	0.39	0.51	0.55	1.12	15.80	**76.8**	3.77	0.42	0.09
	8	0.55	0.27	0.27	0.44	0.97	0.98	13.16	**80.54**	2.48	0.34
	9	0.48	0.12	0.27	0.33	0.54	1.09	1.72	12.60	**81.3**	1.53
	10	0.30	0.09	0.14	0.17	0.21	0.17	0.58	1.00	7.79	**89.5**